

# Watt's Happening? #124

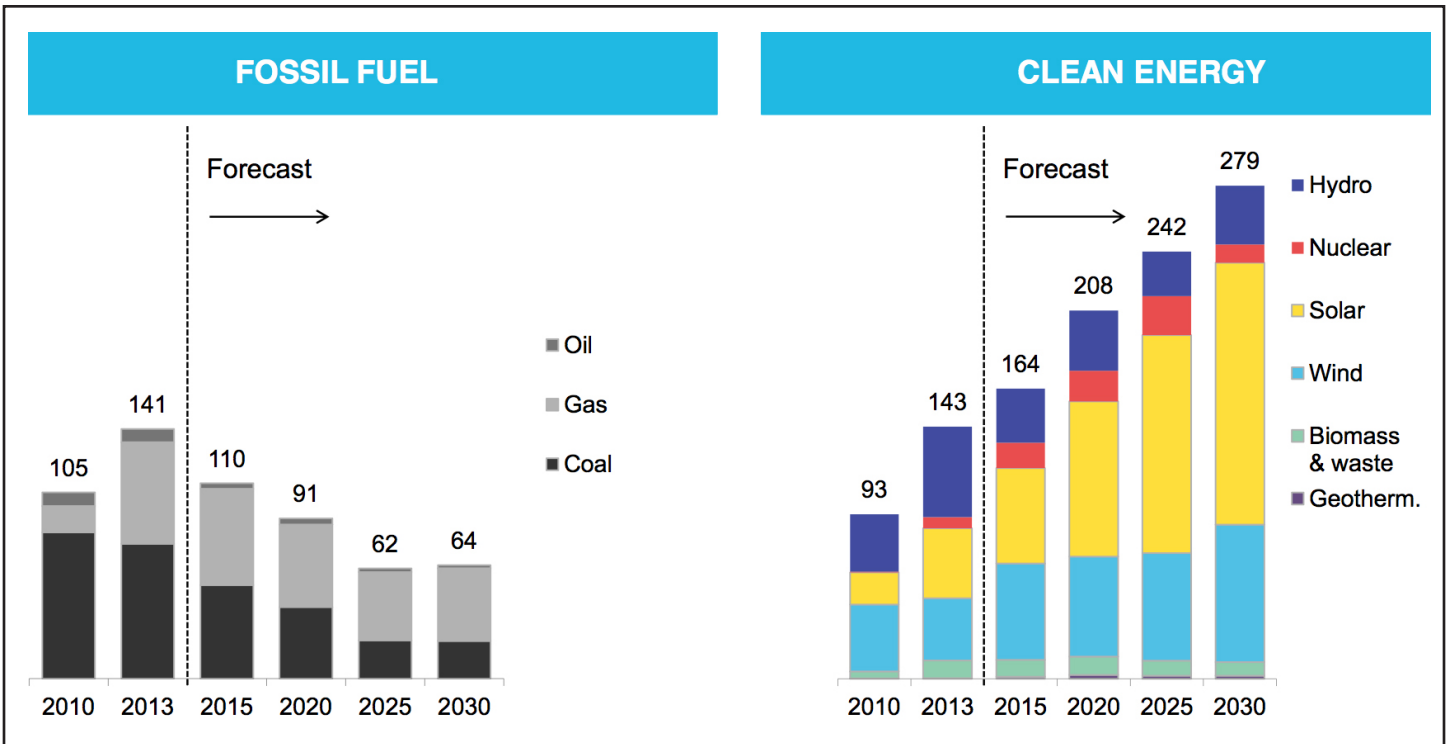
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# Clean Energy Update



*The clean energies of solar and wind will continue to lead energy growth into the 21st century, having already outstripped growth in fossil fuels in 2014. As time marches on, it will become more and more difficult to compete with energy sources that require no fuel to operate and produce no pollution. (Bloomberg New Energy Finance)*

First off, let's define what I mean by "clean" energy.

There are many sources of energy in the world today, used roughly in this order: coal, natural gas, hydroelectric, nuclear, wind, solar, biomass and geothermal.

None of them come without an environmental price tag. Our job is to figure out which of these is the "cleanest" with the lowest environmental price and move in that direction – quickly where

possible!

The good news is that's what seems to be happening: the dirtiest fuels are being replaced by the cleanest. Coal, oil and gas, the classic fossil fuels, are falling out of favour, with a wave of coal plant closures around the world.

Natural gas, now cheap and plentiful thanks to frac technology, is temporarily replacing much of this coal burning, but the carbon emissions from extracting gas are

looking worse every time we do another study.

Hydroelectricity from big dams is also falling out of favour: flooding bio-diverse river valleys and then contaminating the downstream ecology with mercury are both bad ideas.

Nobody wants a nuclear plant in their backyard, and who can blame them, when one gram of plutonium (the most toxic substance known) will give one

million people cancer.

Biofuels (such as wood waste), if properly burned in state of the art facilities, are considered “clean” since the carbon emitted will be re-absorbed by the biosphere and turned into more biofuel. But it’s still using fuel and creating waste that has to be dealt with.

That leaves the three I (and most experts) consider to be the cleanest energy sources: wind, solar and geothermal. All three burn no fuel, but instead tap into the natural forces that nature provides free of charge: the immense power of wind, life-giving sunlight and the natural heat of our mostly molten Earth. They are inexhaustible, they produce no pollution during operation, they are simple and relatively low-tech, safe and reliable.

Nothing is perfect, but these three are pretty darn good. And their use, especially wind and solar, is growing very rapidly.

### **AUSTRALIA BUILDS “VIRTUAL” POWER PLANT**

Over the next four years, 50,000 homes in South Australia will each receive a free solar panel array and Tesla batteries, which will all be interconnected to create the world’s largest “virtual” power plant.

Provided free to households and financed by the sale of excess electricity generated by the network, households will benefit with significant savings on their energy bills.

This innovative power plant will generate 250 megawatts of solar energy and will have 650 megawatt hours of battery storage.

60 percent of electricity generation in Australia is from coal, with 14 percent from renewables, but many of their coal plants are slated for closure. Their existing system was proven fragile after the state-

wide blackout caused by an “unprecedented” storm in 2016.

The government sees the move to a distributed solar/battery energy system as a move to greater reliability and energy security while benefiting tens of thousands of people directly.

### **SOLAR PULLS AHEAD**

Solar continues to move ahead of wind as the fastest growing energy source on the planet.

Last year saw a global increase of 26% for the solar industry (an investment of about \$150 billion), with another record 106 gigawatts expected to come on-line this year. That’s one million 340-watt solar panels installed EVERY DAY.

### **EV’s POISED TO LEAD**

China is positioning itself to become the “Detroit of electric vehicles.” Huge battery plants similar in size to Tesla’s Gigafactory are in the works, with plans to triple the rest of the world’s capacity combined.

Meanwhile, the Korean car maker Hyundai is zooming ahead of the competition to be the first international automaker to bring an electric car to India, the world’s largest country. Indian Prime Minister Narendra Modi wants all new cars sold in India to be electric by 2030.

Even Big Oil is waking up to the new reality of electric transportation. Oil giant BP is installing, over the next two months, rapid electric car chargers at all of its petrol stations across the U.K.

Can we power the whole world with clean electricity? Yes we can, and that’s exactly where we’re headed.

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